

**Bromine, Chlorine or Iodine Functional Polymer Electrolytes
Crosslinked by E-Beam**

Abstract

5 A method is provided for making a crosslinked polymer electrolyte, typically in
the form of a membrane for use as a polymer electrolyte membrane in an electrolytic
cell such as a fuel cell, as well as the polymer so made, the method comprising
application of electron beam radiation to a highly fluorinated fluoropolymer
comprising: a backbone derived in part from tetrafluoro-ethylene monomer, first
10 pendent groups which include a group according to the formula $-\text{SO}_2\text{X}$, where X is F,
Cl, Br, OH or $-\text{O}^-\text{M}^+$, where M^+ is a monovalent cation, and second pendent groups
which include Br, Cl or I. Typically, the membrane has a thickness of 90 microns or
less, more typically 60 or less, and most typically 30 microns or less.